

## CLAIMS

1. A radio system comprising a plurality of clusters of spatially separate radio units having transceiving means and received signal strength determining means, each of the radio units having an individual identity, each cluster being associated with an interrogating station comprising transceiving means for communicating with at least the radio units in its cluster, a central station having transceiving means for communicating with a plurality of the interrogating stations and storage means for storing a database comprising the locations of the radio units, and at least one transponding station having transceiving means and its own radio identity, whereby when it is required to determine the location of the transponding station the central station transmits an enquiry signal including its radio identity to the interrogating stations which rebroadcast the enquiry signal, the transponding station in response to hearing its radio identity in an enquiry signal transmits a reply signal including its own radio identity, the radio units in response to identifying the transponding station determine the received signal strength, and each of the radio units relaying the radio identity and the determined received signal strength together with its own identity to at least one of the interrogating stations which relays the information to the central station which computes the location of the transponding station relative to the positions of the radio units.
2. A radio system as claimed in claim 1, characterised in that the transceiving means of the at least one transponding station transmits a reply signal at a frequency corresponding substantially to the frequency to which said radio units are tuned.
3. A radio system as claimed in claim 1, characterised in that the transceiving means of the at least one transponding station receives and transmits on the same frequency and in that at least the radio units and at least one of the interrogating stations include frequency changing means for

changing at least their receive frequencies to the transmitting frequency of the at least one transponding station.

4. A method of locating at least one transponding station having its own radio identity in the radio coverage area of a radio system comprising a plurality of clusters of spatially separate radio units having transceiving means and received signal strength determining means, each of the radio units having an individual identity, each cluster being associated with an interrogating station comprising transceiving means for communicating with at least the radio units in its cluster, and a central station having transceiving means for communicating with a plurality of the interrogating stations and storage means for storing a database comprising the locations of the radio units, wherein when it is required to determine the location of the transponding station, the central station transmits an enquiry signal to the interrogating stations which in turn broadcast the enquiry signal, the transponding station in response to hearing its radio identity in an enquiry signal transmits a reply signal including its own radio identity, the in-range radio units identifying the transponding station and determining the received signal strength and relaying the radio identity of the transponding station, the determined received signal strength and its own identity to the interrogating station which relays the information to the central station which computes the location of the transponding station relative to the positions of the radio units.

5. A method as claimed in claim 4, characterised by the at least one transponding station using a received signal as a reference frequency against which its own oscillator frequency is adjusted.

6. A method as claimed in claim 4, characterised in that in anticipation of a transmission by the at least one transponding station, the radio units and at least one of the interrogating stations adjust their receive frequency to the transmit frequency of the at least one transponding station.

7. A method as claimed in any one of claims 4 to 6, characterised by the radio metering units being placed in a faster wake-up mode when determining the location of a transponder station than in a non-location determining mode.

5

8. A transponding station comprising non-volatile storage means for storing the unit's radio identity, a radio receiver for receiving an enquiry signal, means for comparing the stored radio identity with a radio identity in the enquiry signal, and means responsive to the radio identities being considered 10 to be substantially the same for activating a transmitter to send a reply signal having at least one characteristic different from the received enquiry .

9. A transponding station as claimed in claim 8, characterised in that the radio receiver is adapted to receive the enquiry signal at a first 15 frequency and to relay a signal to the transmitter for transmission at a second frequency.

10. A transponding station as claimed in claim 9, characterised in that the radio receiver and the transmitter operate on the same frequency.

20